

CLAIMS

1. A subpart of a drill string, the subpart including
an outer circumferential surface which is contoured
5 and adapted to engage a wall of an open uncased
borehole in a sliding action with a low angle of
attack essentially continuously exerting a
compacting pressure on mud cake and/or cuttings
present in the annulus between the drill string and
10 said wall.
2. The subpart of claim 1 comprising a bottom and top
section for connection to the drill string and a
main section having an inner central bore for the
15 passage of drilling fluid from the surface and one
or more outer openings for said drilling fluid and
cuttings return flow to the surface wherein an outer
contour of said subpart is shaped to engage the open
uncased wall of said borehole at an angle of attack
20 of less than 45 degrees and extends to an outer
diameter of more than 70% of a nominal diameter of
said borehole.
3. The subpart of claim 2 comprising a cylindrical main
25 section having an outer diameter of more than 70% of
the nominal diameter of the borehole and one or more
bores providing a return flow path for the drilling
fluid and cuttings.
- 30 4. The subpart of claim 1 having an outer
circumferential surface which is contoured and
adapted to minimize laterally acting forces or

resistance during a sliding action.

5. The subpart of claim 2 having one or two connectors adapted to connect to a drill collar section of the drill string.
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6. The subpart of claim 2 having a bottom and top section for a force-transmitting connection to the drill string thus following a rotational motion of the drill string generated at a surface location. .
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7. The subpart of claim 1 wherein the contoured surface is made from an abrasive resistant material.
- 15 8. The subpart of claim 1 or 2 having a central main section and two or more extendable elements adapted to simultaneously extend under drilling condition to contact the wall of the borehole.
- 20 9. The subpart of claim 8 wherein the two or more extendable elements engage under drilling conditions the wall of the borehole at an angle of attack of less than 45 degrees.
- 25 10. The subpart of claim 8 wherein the two or more extendable elements include compliant elements.
11. The subpart of claim 8 wherein the two or more extendable elements are adapted to engage the wall of the borehole when pressurized drilling fluid is pumped from a surface location through the drilling
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string.

12. The subpart of claim 8 wherein the two or more extendable elements include one or more nozzles
5 connected by a flow path to the inner opening of the subpart.
13. The subpart of claim 8 wherein the two or more extendable elements include one or more hinge
10 sections.
14. The subpart of claim 8 wherein the extendable element comprises a first extendable section and a second extendable section and a hinge element
15 connecting said first and second extendable sections.
15. The subpart of claim 8 wherein the extendable element comprises an arcuate vane element rotatably
20 mounted on a hinge element.
16. The subpart of claim 8 wherein the extendable element comprises a first extendable section and a second extendable section and a hinge element
25 connecting said first and second extendable sections.
17. A drill string comprising in a section that passes through the open uncased borehole one or more
30 subparts in accordance with any of the preceding claims.

18. A drill string of claim 17 comprising one or more subparts in accordance with any of the preceding claims with at least one of said subparts being at a location in said drill string above a bottom hole assembly including drill collars.
19. A drill string of claim 17 comprising a plurality of subparts in accordance with any of the preceding claims located at intervals along the open hole section of the drill string.
20. A method of consolidating a borehole during a drilling operation comprising the steps of
- assembling a drill string including one or more subparts each having an outer circumferential surface which is contoured and adapted to engage a wall of an open uncased borehole with a low angle of attack essentially continuously exerting a compacting pressure on mud cake and/or cuttings present in the annulus between the drill string and said wall;
 - pumping from a surface location a drilling fluid; and
 - rotating said drill string from said surface location; thereby causing the subpart or subparts to slide along the wall of the borehole.
21. The method of claim 20 wherein the outer circumferential surface of the one or more subparts is essentially continuously forced into contact with the wall surrounding the borehole during the drilling operation.

22. The method of claim 21 using pressurized drilling fluid to force the outer circumferential surface into contact with the formation.

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